UPPER STOPPER STRUCTURE OF ZIPPER

FIELD OF THE INVENTION

The present invention relates to zippers, and particularly to an upper stopper structure of a zipper. The upper stoppers will not be buckled to the pull due to a larger force. The teeth guided into the pull from the gap between the end stop and inner stopper can not be guided out from the gap.

BACKGROUND OF THE INVENTION

In one prior art, the upper stops of a zipper is disclosed. The upper stoppers include buckling proof stoppers, an end stop and an inner stopper. The lower half of the end stop is extended with fixing strip having a tip to generate a gap with the inner stopper so that the lateral plate of the pull can pass through the gap obliquely. After guiding, it will not separate from the teeth of the zipper. However in normal user, above mentioned prior art can be used well, but if improper force is applied, the pull possibly falls out from the gap 33. Thereby, this is a problem to be resolved.

Furthermore, the improper use of a zipper is induced from an overlarge force applied to the pull so that the pull is buckled to the upper stoppers. As a result, the plastic upper stoppers lose of the stop function. Namely, weak structure of the upper stoppers induces an insufficient tolerance.

Moreover, the upper stoppers of the prior art zipper are separated by the middle post of the pull so as to have a Y shape. Since the inner walls of the two upper stoppers are flat or cambered surfaces, they are two points contact with the lateral plate so that the upper stoppers are easy to move abnormally, even the Y shape area will be over-expanded to induce the pull strips at the two sides of the pull generate wrinkles or become coarse. Not only it is

unbeautiful, but also the clothes having the zipper generates wrinkles.

Moreover, the plastic upper stoppers are not integrally formed. Because before injecting the upper stoppers, the pull strips in the mold must be flattened, a retainer is used to fix them. As a result, it is easy to induce too large gaps between the inner stopper and teeth or between the buckling proof stopper and the teeth. Not only the appearance is not beautiful, but also the lateral plate of the pull will be guided out from the teeth.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a structural perspective view of the zipper strip of the present invention.

Fig. 2 is a perspective view about the right and left upper stopper of the present invention.

Fig. 3 is an elevational view about the right and left upper stopper of the present invention.

Fig. 4 is a schematic view showing that the pull is guided from the right upper stopper according to the present invention.

Fig. 5 is an enlarged schematic view of Fig. 4.

Fig. 6 is a schematic view showing that the pull can not be guided out from the right upper stopper according to the present invention.

Fig. 7 is an enlarged schematic view of Fig. 6.

Fig. 8 is a schematic view showing the two upper stoppers do not enter into the pull according to the present invention.

Fig. 9 is a schematic view showing that the two upper stoppers has entered into the pull according to the present invention.

Fig. 10 is a schematic view showing the block at a lower end of the upper stoppers according to the present invention.

Fig. 11 is another schematic view showing a block at a lower end of the upper stoppers.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Fig. 1, the zipper strip 100 of the present invention includes a left and a right pull strips 101 which are parallel. Each pull strip 101 has a teeth strip 102 at the inner lateral side of the pull strip 101 and with a plurality of teeth 103 thereon. The two pull strips 101 are engaged by the two teeth strips 102. A left and a right upper stopper 10 are at the upper sides of the two banks of the teeth 103. Each of the pull strips 101 has an closed or open lower stopper 4 at the lower side thereof. Since the lower stoppers 104 are not the main concern of the present invention, the details will not described here. A pull 5 is coupled with the two pull strips 101 for engaging or separating the two banks of the teeth 103. The right upper stopper 10 is formed by an end stop 2 and an inner stopper 3. The left upper stopper 10 is installed by a single stop unit 1. In the present invention, the components of the left and right upper stopper 10 are changeable.

With reference to Figs. 2 and 3, the structure of the left upper stopper will be described here firstly. The left upper stopper is a stop unit 1. An outer side of the top of the stop unit 1 has a cambered protruding stop block 11 and an inner lateral side of the stop unit 1 has a cambered concave wall 12. An upper end of the concave wall 12 has an upper cambered protruded corner 13 and a lower end thereof has a lower cambered protruded corner 14. A lower end of the stop unit 1 near the inner side is installed with a downward protruded triangular block 15. An inner side of the triangular block 15 has an inclined guide surface 16.

Next, the right upper stopper includes an end stop 2 and an inner stopper

3. The end stop 2 is above the inner stopper 3. The end stop 2 and the inner stopper 3 are connected by a connecting plate 31. An outer side of the top of the end stop 2 has a round protruding stop block 21. A lower end of the end stop 2 near the outer side is extended with a narrow long elastic fixing strip 22 having a round tip 23. A lower side of the end stop 2 is formed with a concave cambered guide surface 24 from the inner side thereof to the fixing strip 22. A cambered surface of the cambered guide surface 24 extends upwards and outwards to be adjacent to the fixing strip 11. The connecting plate 31 is at an inner side of the end stop 2 and he inner stopper 3. The connecting plate 31, end stop 2 and inner stopper 3 are integrally formed. Only the end stop 2 and the inner stopper 3 are connected to the pull strip 101, while the connecting plate 31 is not connected to the connecting plate 31, but is tightly adjacent to the lateral side of the teeth strip 102 (referring to Fig. 5). A cambered concave wall 33 extends from the upper end of the end stop 2 to an inner side of the connecting plate 31 so that a top of the end stop 2 is formed with a protruded upper cambered corner 34. Moreover, a top edge of the inner stopper 3 is an inclined guide surface 37. A gap is retained between the inclined guide surface 37 and the fixing strip 22. A right lower end of the inner stopper 3 is a lower cambered protruded corner 38. A lower end of the inner stopper 3 near the inner side is formed with a protruded triangular block 35. An inner side of the triangular block 35 is an inclined guide surface 36.

With reference to Figs. 4 and 5, Fig. 4 is a schematic view showing that the pull 5 is guided into a zipper. Fig. 5 is a partial enlarged view of Fig. 4. Internal of the pull 5 contains a middle post 51 for separating the left and right teeth and a lateral plate 52 for confining the movement of the teeth. Thereby, a Y shape guide groove 53 is formed in the pull 5. The connecting plate 31 is thinner for guiding the lateral plate 52 of the pull 5. Since a larger space is formed between the cambered guide surface 24 at a lower edge

of the end stop 2 and the inclined guide surface 37 at the top of the inner stopper 3, the lateral plate 52 in the space can enter into the gap 32 along the cambered guide surface 24. Then the fixing strip 22 is pushed outwards so that the gap 32 is enlarged. Thereby, the lateral plate 52 can pass through the gap 32 until the lateral plate 52 passes through the gap 32. After the lateral plate 52 passes through the gap 32 completely, the pull 5 can be pulled downwards so that the teeth 103 at one side is guided into the Y shape guide groove 53 of the pull 5. Then the teeth 103 at another side can be guided into the Y shape guide groove 53 of the pull 5 and the two banks of teeth 103 are engaged.

With reference to Figs. 6 and 7, a schematic view showing an operation that the pull is guided out from the zipper. Fig. 7 is a partial enlarged view of Fig. 6. In the drawing, when the pull 5 is guided out from an upper end of the zipper, it is necessary that the lateral plate 52 passes through the gap 32. Since the lateral plate 52 is wider than the gap 32, after the top of the lateral plate 52 touches the round tip 23 of the fixing strip 22, the fixing strip 22 will shift inwards. Since the teeth strip 102 is higher than the fixing strip 22, the fixing strip 22 can not pass through the teeth strip 102 (referring to Fig. 7). It only resists against the lateral side of the teeth strip 102 so that the gap 32 can be reduced. Thereby, the lateral plate 52 can not pass through the gap 32 even a larger force is applied to the pull 5. Because the teeth strips 102 shift and thus the gap 32 is reduced, the lateral plate 52 can not passes therethrough and thus the pull 5 can not separate from the zipper strips 100 so as to achieve the function of preventing from separation.

Referring to Figs. 8 and 9, schematic views showing that the upper stoppers of the zipper do not enter into and enter into the pull. The function of the Y shape guide groove 53 of the pull 5 is to induce the teeth 103 at the inner lateral sides of the pull strip 101 to engage with one another. When the pull 5 moves to a top of the teeth 103 (referring to Fig. 9), the upper

stoppers 10 will be guided into the pull 5. At this moment, the stop blocks 11, 12 of the stop unit 1 and end stop 2 will resist against tops of two lateral plate 52 so that the upper stoppers 10 will not be embedded into the pull 5.

When the pull 5 is pulled upwards improperly, the right upper stopper causes that the gap between the end stop 2 and inner stopper 3 will not over expand by the effect of the connecting plate 31. Moreover, the pull strips 101 and teeth strip 102 between the end stop 2 and inner stopper 3 will not be over-pulled so as to prevent from damage, deformation or looseness. Thereby, to the right upper stopper, the connecting plate 31 has the effect of enhancement.

Next, after the pull 5 is pulled upwards (referring to Fig. 9), the lowest points of the cambered concave walls 12, 33 of the two upper stoppers 10 do not resist against the middle post 51 of the pull 5. Only the upper cambered corners 13, 34 and the lower cambered corner 14 resist against the middle post 51. Besides, the contacts points of the left upper stopper, middle post 51 and the lateral plate 52 are the protruded stop block 11, upper cambered corner 13 and lower cambered corner 14 for enhancing the force applied thereon (in the prior art, only two contact points are designed). The cambered concave wall 12 and outer lateral wall 17 of the stop unit 1 is not in contact with the middle post 51 and the lateral plate 52. When the stop unit 1 is over-pressed by the pull 5, it can be deformed in a finite gap. The deformation is beneficial to the pull 5 to separate from the stop unit 1. When the pull 5 separates from the stop unit 1, it can restore to the original state. Similarly, the contact points of the right upper stopper, middle post 51, and lateral plate 52 are stop block 21, upper cambered corner 34 and lower corner 38 for enhancing the reactive force. The cambered concave wall 33 of the right upper stopper is not in contact with the lateral wall of the middle post 51. When the right upper stopper is over-pressed by the pull 5, it can deform in a finite gap so that the pull 5 can retract from the right upper

stopper to restore. Thereby, the two upper stoppers 10 will not be clamped when the pull 5 is over-pulled, and moreover, the opening of the Y shape guide groove 53 is smaller than the prior art. Thus the surface of the pull strip 101 is more flat and has less wrinkles.

Besides, Fig. 10 shows that the lower ends of the stop unit 1 and inner stopper 3 have blocks 15, 35 which match to the concave openings at the later edges of the teeth head of the teeth 103. Other than the effect of shielding the concave portions, it can reduce the gap to the teeth 103. Since the triangular blocks 15, 35 are protruded from a lower edge of the stop unit 1 and inner stopper 3, it is not the same as the prior art upper stoppers having a horizontal lower edge. Thereby, it can prevent the lateral plate 52 of the pull 5 from being guided out from the gap so that the triangular blocks 15, 35 has the same function as the stop blocks.

Moreover, in Fig. 15, the inner sides of the triangular blocks 15, 35 are the inclined guide surfaces 16, 36 so that when the stop unit 1 and inner stopper 3 are guided into the pull 5, they can slide into the Y shape guide groove 53 from the lateral wall of the middle post 51, but not stop the lateral wall of the middle post 51 in force so that the upper stoppers are well matched to the pull 5.

Advantages of the present invention will be described here. In the present invention, the upper stoppers will not be buckled to the pull due to a larger force. The teeth guided into the pull from the gap between the end stop and inner stopper can not be guided out from the gap. The pull is difficult to be guided out from between the inner stopper and teeth. The pull strips and teeth strips between the end stop and the inner stopper are not easy to deform or be loose. Moreover, the movement of the two upper stoppers to the pull can be smoothly and easily.

Although the present invention has been described with reference to the preferred embodiments, it will be understood that the invention is not limited

to the details described thereof. Various substitutions and modifications have been suggested in the foregoing description, and others will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.